

## FIXED POINT THEOREMS FOR NONSELF OPERATORS IN $b$ -METRIC SPACES

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**Abstract.** In this paper we prove some fixed point theorems for different type of contractions in the setting of a  $b$ -metric space. The starting point was a recent result of Rus and Şerban [16]. The presented theorems extend, generalize and unify several recent results in the literature.

**Key Words and Phrases:** Fixed point,  $b$ -metric space, nonself contraction, data dependence.

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### REFERENCES

- [1] H. Aydi, M.-F. Bota, E. Karapinar, S. Moradi, *A common fixed point for weak  $\phi$ -contractions on  $b$ -metric spaces*, Fixed Point Theory, **13**(2012), no. 2, 337-346.
- [2] I.A. Bakhtin, *The contraction mapping principle in quasimetric spaces*, Funct. Anal., Unianowsk Gos. Ped. Inst., **30**(1989), 26-37.
- [3] V. Berinde, *Generalized contractions in quasimetric spaces*, Seminar on Fixed Point Theory, Preprint **3**(1993), 3-9.
- [4] V. Berinde, *Sequences of operators and fixed points in quasimetric spaces*, Stud. Univ. "Babes-Bolyai", Math., **16**(1996), no. 4, 23-27.
- [5] V. Berinde, M. Păcurar, *Fixed point theorems for nonself singlevalued almost contractions*, Fixed Point Theory, **14**(2013), no. 22, 301-312.
- [6] M. Boriceanu, A. Petruşel, I.A. Rus, *Fixed point theorems for some multivalued generalized contractions in  $b$ -metric spaces*, International Journal of Mathematics and Statistics, **6**(2010), 65-76.
- [7] M. Bota, *Dynamical Aspects in the Theory of Multivalued Operators*, Cluj University Press, 2010.
- [8] A. Chis-Novac, R. Precup, I.A. Rus, *Data dependence of fixed points for nonself generalized contractions*, Fixed Point Theory, **10**(2009), no. 1, 73-87.
- [9] S. Czerwinski, *Contraction mappings in  $b$ -metric spaces*, Acta Mathematica et Informatica Universitatis Ostraviensis, **1**(1993), 5-11.
- [10] S. Czerwinski, *Nonlinear set-valued contraction mappings in  $b$ -metric spaces*, Atti Sem. Mat. Univ. Modena, **46**(1998), 263-276.
- [11] M. Păcurar, *A fixed point result for  $\varphi$ -contractions on  $b$ -metric spaces without the boundedness assumption*, Fasc. Math., **43**(2010), 127-137.

- [12] A. Petrușel, I.A. Rus, M.-A. Șerban, *Fixed points, fixed sets and iterated multifunction systems for nonself multivalued operators*, Set-Valued and Variational Anal., DOI 10.1007/s11228-014-0291-6, to appear.
- [13] S. Reich, A.J. Zaslavski, *A fixed point theorem for Matkowski contractions*, Fixed Point Theory, **8**(2007), no. 2, 303-307.
- [14] I. A. Rus, *The theory of a metrical fixed point theorem: theoretical and applicative relevances*, Fixed Point Theory, **9**(2008), no. 2, 541-559.
- [15] I.A. Rus, *Generalized Contractions and Applications*, Cluj University Press, Cluj-Napoca, 2001.
- [16] I.A. Rus, M.A. Șerban, *Some fixed point theorems for nonself generalized contraction*, to appear.
- [17] I.A. Rus and M.A. Șerban, *Extensions of a Cauchy lemma and applications*, Topics in Mathematics, Computer Science and Philosophy, Cluj University Press, 2008, 173-181.

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